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TOUGH GUYS GO GREEN: EXPANDING DOD'S ROLE IN ENERGY SECURITY

BY

LIEUTENANT COLONEL MICHAEL FARRELL
United States Marine Corps

USAWC CLASS OF 2009

U.S. Army War College, Carlisle Barracks, PA 17013-5050

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Lieutenant Colonel Michael Farrell
United States Marine Corps

Dr. Douglas V. Johnson
Project Adviser

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U.S. Army War College
CARLISLE BARRACKS, PENNSYLVANIA 17013

ABSTRACT

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America's dependency on fossil fuels is a critical National Security issue. The United States needs to develop alternative means to power and fuel aircraft, ships and ground vehicles with the ultimate goal of achieving energy independence from foreign oil sources. This monograph examines the linkages between a National Energy Policy, National Security Strategy, National Defense Strategy and National Military Strategy. Our dependence on foreign oil sources and the lack of adequate supplies of fossil fuels is a critical National Security issue; therefore the United States Military should be at the forefront of looking for and employing alternative fuels and sources of energy. The plan to develop alternative fuels and power sources must be written into the National Security Strategy, National Defense Strategy and the National Military Strategy.

TOUGH GUYS GO GREEN: EXPANDING DOD'S ROLE IN ENERGY SECURITY

> Let this be our national goal: At the end of this decade, in the year 1980, the United States will not be dependent on any other country for the energy we need to provide our jobs, to heat our homes, and to keep our transportation moving.
>
> —Richard M. Nixon

The development of a comprehensive National Energy Security Policy that focuses on a clear, coherent goal and end state is of utmost strategic importance to the United States. Every United States' President since Richard Nixon has espoused the goal of energy independence as a basis for our national energy policy. The United States has made little progress in achieving this goal. In fact, some would argue that, over the last 40 years, the U.S. has moved further away from achieving energy independence. Achieving energy independence must be the foundation of the United States' National Energy Security Policy. Further, energy independence cannot be achieved without reducing the nation's dependency on foreign oil. Our Nation's national security organizations should be playing a significant role in achieving energy security through eliminating our dependence on foreign oil. The Department of Defense in particular, possesses the innovative skills, intellectual capability, resources, and the ethos to take on this effort. The National Energy Security Policy should be vested within the Department of Energy's (DOE) National Energy Policy, as well as threaded throughout the National Security Strategy (NSS), the National Defense Strategy (NDS) and the National Military Strategy (NMS).

National Interests Analysis

There are two enduring national interests applicable to developing independence from foreign oil; they are maintaining a stable international order and promoting economic prosperity. Utilizing the United States Army War College model these interests can be further refined into grand strategic objectives as the preservation of American security and the bolstering of the American economy.[1] According to the Army War College model, these national interests fall primarily into the "economic well-being" category but also have direct links to the other two categories of security of the homeland and promotion of American values. These are clearly vital interests of the United States in that they are directly related to our nation's safety, well-being and directly effect the survival of the Nation. Nearly every U.S. President since Richard Nixon has stated as such, as indicated later in this paper. It is in the United States' vital national interest to pursue energy independence through a strong National Energy Security Strategy that directly supports the National Security Strategy with this vital goal threaded through our National Defense and National Military Strategies.

Background

The United States began to import foreign oil in small amounts in 1946 as America began to consume more oil than it produced.[2] The post World War II period saw a dramatic increase in the number of passenger cars on U.S. highways and a corresponding increase in petroleum demand. America's dependence on foreign sources of oil really began to take hold in the 1960's. U.S. domestic oil production peaked in the early 1970's at approximately 10 million barrels per day and has been

steadily declining ever since.[3] Subsequently the U.S. lost its position as the world's single largest producer of oil to Saudi Arabia in the late 1970's.

The U.S. suffered its first "energy crisis" in October 1973 when the Organization of Arab Petroleum Exporting Countries (OPEC) declared an oil embargo in response to the Yom Kippur War.[4] In November of that year, the President of the United States, Richard Nixon, addressed the American people in a speech, which laid out his National Energy Policy. He concluded his address with an observation that I believe captures the essence of the national energy security issue: "Let me conclude by restating our overall objective. It can be summed up in one word that best characterizes this Nation and its essential nature. That word is 'independence.' From the beginning 200 years ago, throughout its history, America has made great sacrifices of blood and also of treasure to achieve and maintain its independence. In the last third of this century, our independence will depend on maintaining and achieving self-sufficiency in energy."[5]

American presidents have struggled with this issue in the last third of the 20th century and have seen very little progress toward the great goal of achieving energy independence by the early 21st century. In April 1977, President Jimmy Carter claimed that the energy crisis "is the greatest challenge our country will face during our lifetimes."[6] Two years later, the Nation would face its second "energy crisis" spurred by the Iranian Revolution, the Iranian Hostage Crisis and the Iran/Iraq war.[7] The basis of President Carter's energy plan was conservation, and some significant progress was made. During the 1980's the U.S. lost much of its momentum on energy issues and the nation's dependence on foreign oil continued to grow.

By 1998, the United States imported approximately 50% of its oil needs. In his 1998 National Security Strategy, President William J. Clinton identified the following areas as elements of his energy security strategy: "a fundamental shift away from reliance on Middle East oil; conservation measures, greater efficiency, research into alternative fuels and regional stability and security in major producing areas." [8]

When President George W. Bush took office he directed Vice President Dick Cheney to develop a National Energy Policy.[9] Through the work of the National Energy Policy Development Group (NEPDG), a National Energy Policy report was published in 2001. The report provided an extensive list of recommendations for the federal government to include in its National Energy Policy. These recommendations have been included in the Department of Energy's Strategic Plan and many of the report's recommendations found their way into legislation, but it appears that a genuine National Energy Policy or a National Energy Security Policy was never produced.

The third "energy crisis" is said to have begun in 2004 when the growth of Asian oil demand, the War in Iraq, and a weaker U.S. dollar began to drive the price of a barrel of oil up to record levels. In 2004, the United States imported 65% of its domestic oil needs.[10] By 2006 the price of oil began a steep climb to unprecedented levels. In the summer of 2008, the price for a barrel of oil reached $145.16 and the U.S. economy tumbled into what could be a deep and long lasting recession.[11]

President George W. Bush made his now famous "America is addicted to oil" statement in his 2006 State of the Union address.[12] President Bush went on to assert that we must change how we power our automobiles and that we need to make our dependence on Middle East oil a thing of the past. The current energy crisis increased

the necessity for government action which led to the enactment of the National Energy Policy Act of 2005, the issuance of Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management" of March 2007 and the passing of the Energy Independence and Security Act of 2007. In his 2007 State of the Union address, President Bush presented his plan to reduce gasoline usage by 20 percent in ten years through a combination of increasing the supply of renewable and alternative fuels and by reforming the Corporate Average Fuel Economy (CAFE) standards.[13]

President Elect Barack Obama gave the nation a glimpse of his future energy security goals and policy during a speech on energy policy at the Detroit Economic Club in May 2007:

> At the dawn of the twenty-first century, the country that faced down the tyranny of fascism and communism is now called to challenge the tyranny of oil. For the very resource that has fueled our way of life over the last hundred years now threatens to destroy it if our generation does not act now and act boldly. We know what the dangers are here. We know that our oil addiction is jeopardizing our national security — that we fuel our energy needs by sending $800 million a day to countries that include some of the most despotic, volatile regimes in the world. We know that oil money funds everything from the madrassas that plant the seeds of terror in young minds to the Sunni insurgents that attack our troops in Iraq.[14]

The new President asserts in his energy agenda that he has a "comprehensive plan to invest in alternative and renewable energy, end our addiction to foreign oil, and address the global climate crisis and create millions of new jobs."[15] The words are familiar; the times are different, yet the problem still exists. Time will tell if Barack Obama will really act "now and boldly." For this is exactly what we need, bold action that places a top priority on our Nation's energy security. Returning to the earlier quote from Richard Nixon, our Nation's independence will depend on our ability to free ourselves

from the grips of foreign oil. The time to act is now and it must be done boldly. Our Nation's military can play a significant role in achieving this critical objective.

Today, the United States consumes 24 percent of the world's annual oil output and produces only 3 percent of the world's oil.[16] Over 70% of the oil that is consumed in the United States is consumed in the transportation sector. The transportation sector is the least diversified sector as well with petroleum accounting for 95% of the fuel consumed.[17] The rest is consumed primarily in the industrial sector and the home heating oil sector. Only a small fraction is utilized to produce electricity. It quickly becomes obvious that any proposed solution that intends to alleviate our nations dependence on foreign oil must address the usage in the transportation sector.

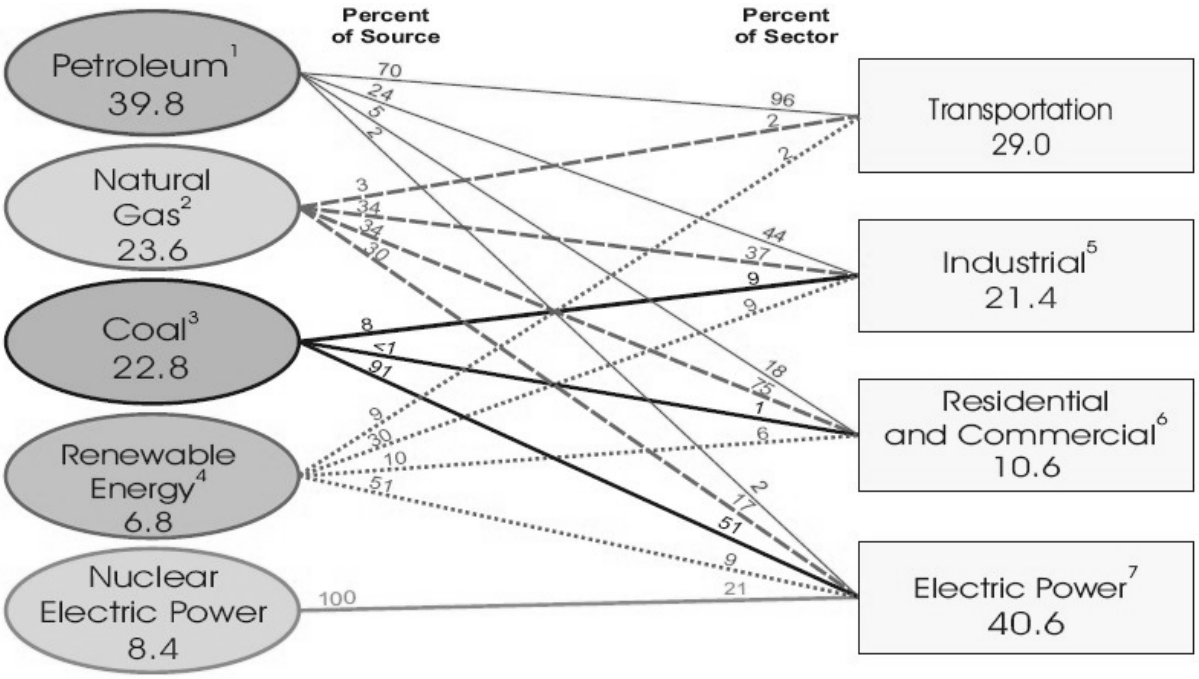

Figure 1. U.S. Energy Consumption by Source and Sector, 2007 (Quadrillion Btu)[18]

Energy Security

It is important to properly define national energy security. An examination of national security documents and Department of Energy literature does not provide a specific definition. The clearest definition of energy security is provided by Paul Roberts, in his book *The End of Oil*. Mr. Roberts contends that energy security is "our ability to meet immediate energy demand, that is to produce adequate volumes of fuel and electricity at affordable prices and to move that energy to the countries that need it, when they need it."[19] Mr. Roberts' definition is globally oriented, but can easily be tailored to focus on a single nation. However, the energy industry is a global industry interconnected with the global economy. Our vision of energy security must contain a global perspective.

The number one theme in the Department of Energy's Strategic Plan is promoting America's energy security through reliable, clean, and affordable energy. [20] Further, embedded throughout DOE's strategy is the premise that energy security also encompasses infrastructure security and protection against catastrophic events.[21] The National Energy Policy Report of 2001 contains two critical components of energy security; the ideas that energy security should enhance the Nation's economic growth and ensure that adequate resources are available for national defense. Therefore a more comprehensive definition of energy security is offered for inclusion in our national security documents. National Energy Security is the ability of a nation to provide adequate amounts of affordable, safe, and environmentally sound energy to meet immediate demand, ensure economic growth and national defense, while protecting against catastrophic events and ensuring the integrity of the global energy delivery system.

Energy Independence

The United States is currently 70% self sufficient in energy.[22] However, the Oil sector is where the majority of U.S. energy dependence resides. The real issue is oil independence not energy independence and the key to oil independence is reducing demand in the transportation sector. The majority of this demand is derived from automobile use. Ultimately, United States energy independence will be achieved when we develop the means to reduce the automobiles' consumption of oil or develop an alternative to the internal combustion engine and the required distribution system to support it. There are many that believe that such an objective will take several decades or longer to achieve.

Energy independence as envisioned by Richard Nixon involves achieving self-sufficiency in our energy use. This most basic of goals implies that the country can stand-alone without being sustained by other nations' energy supplies. When launching Project Independence in 1970, Richard Nixon declared: "let this be our national goal: At the end of this decade, in the year 1980, the United States will not be dependent on any other country for the energy we need to provide our jobs, to heat our homes and to keep transportation moving."[23] Unfortunately, such a clear definition of energy independence is not widely agreed upon. There are many that believe that energy independence requires the absence of U.S. participation in global energy markets or the complete exclusion of U.S. purchases of oil from foreign sources. Some would say that an energy independence initiative would involve protectionist policies and tariffs. I would offer that energy independence does not suggest a complete prohibition from purchasing foreign sources of oil. Furthermore, energy independence does not equate to producing as much energy as we consume. It is also not a "Green" movement, but a national security

movement. The “green” benefits gained from reducing our dependence on oil will be a by-product of the effort not the primary goal of our efforts.

Energy independence requires reducing the amount of oil we consume to a level, which does not hinder our ability to achieve our national energy security objectives. It means reducing our oil imports to a level, which places the U.S. in a position where our energy decisions are not subject to the control of other nations. It equates to our ability to purchase the amount of oil of our choosing, from the sources of our choosing regardless of pricing or catastrophic events. Unfortunately, many oil-producing nations maintain a hostile or potentially hostile stance toward the United States. Further, Oil disruptions that have led to the energy crises identified earlier in this paper have been

U.S. PETROLEUM IMPORTS (TOP 15 COUNTRIES)	
CANADA	21.5%
MEXICO	13.6%
SAUDI ARABIA	12.8%
VENEZUELA	11.9%
NIGERIA	9.8%
ALGERIA	5.9%
ANGOLA	4.5%
IRAQ	4.3%
RUSSIA	3.7%
VIRGIN ISLANDS	3.0%
UNITED KINGDOM	2.5%
BRAZIL	1.8%
ECUADOR	1.8%
KUWAIT	1.6%
COLOMBIA	1.4%
Source: EIA website, Crude Oil and Total petroleum Imports Top 15 Countries.[24]	

Table 1: Top 15 Countries Sources of US Oil Imports

the result of actions taken by oil producing governments that have been hostile toward the U.S. As a result, a component of our definition of energy independence should take into account eliminating imports of oil from these nations and focusing our imports toward friendly partner nations. Table 1 illustrates the U.S. sources of oil imports from the top 15 countries in 2007.

Energy Policy and Strategy Linkages

Our nation's national energy policy is essentially a collection of documents and legislation that do not provide a comprehensive policy for government agencies and the private sector to look toward for guidance. The national energy policy should create synergy across all government agencies including DoD and provide a unifying effort toward achievement of our national objectives. The closest thing that we have to a national energy policy is the National Energy Policy Report created by the National Energy Policy Development Group (NEPDG). The recommendations of the NEPDG were presented to the President in 2001 and many of the recommendations found their way into energy legislation such as the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007. Many of the recommendations were also incorporated in the DOE's strategic plan, however a national energy policy was never actually produced by the Bush administration. The Obama administration has yet to publish a national energy policy but have posted a collection of energy initiatives and objectives on the White House website, but they do not even closely resemble a comprehensive policy initiative.[25]

The stated goal of the NEPDG is to "develop a national energy policy designed to help the private sector, and, as necessary and appropriate, state and local

governments, promote dependable, affordable, and environmentally sound production and distribution of energy for the future."[26] The NEPDG report outlined five specific national goals: 1. Modernize conservation; 2. Modernize our energy infrastructure; 3. Increase energy supplies; 4. Accelerate the protection and improvement of the environment; and 5. Increase our nation's energy security.[27] Further study of the national energy security initiatives section of the NEPDG report reveals very similar objectives, which are to lead us on the road to energy security. This section of the report contains a noteworthy addition to the list of objectives: strengthening global alliances and international relationships.

When examining the linkages between our national policies and strategies I will be looking at the essential tasks contained in the NSS, the NEPDG report's goals, the NDS objectives and the NMS objectives and priorities. These elements will be utilized as a framework for determining if a consistent flow of ideas, vision, objectives, and goals exists across our national security documents.

While legislation has played a role in forming our policies it is primarily an implementation tool. The details contained in energy policy legislation must logically flow from our policy directives. We should not have to interpret various complicated laws that were written to satisfy constituencies and private interests in order to determine the actual policy objectives. Therefore, a detailed study of energy related legislation is not germane to this discussion of policy continuity. The next logical step is to seek consistency of the objectives outlined in our nation's grand strategy for achieving national security.

The National Security Strategy is the senior national security directive that provides guidance to all government agencies. The 2006 National Security Strategy identifies two primary pillars and 9 essential tasks. These task include the following:

- Champion Aspirations for Human Dignity
- Strengthen Alliances to Defeat Global Terrorism.
- Work with Others to Defuse Regional Conflicts.
- Prevent Enemies From Threatening US, Allies & Friends with WMD.
- Ignite New Era of Global Economic Growth.
- Expand Circle of Development by Opening Societies & Building the Infrastructure of Democracy.
- Develop Agendas for Cooperative Action with Other Main Centers of Global Power.
- Transform America's National Security Institutions to Meet Challenges & Opportunities of the 21st Century.
- Engage the Opportunities & Confront the Challenges of Globalization.[28]

The NSS places a priority on reducing our reliance on foreign energy resources and identifies energy independence as an essential goal. The document also recognizes that the key to energy security is through diversity both in energy types and in the regional sources utilized. This diversification is said to assist in alleviating the "Petroleum Curse" which refers to the corruption that is fostered by oil revenues generated by unstable oil producing states.[29] The NSS further identifies accelerating the development of clean energy technologies by forming partnerships with other nations and regional bodies as well as "enhancing energy security and clean energy

development."[30] Interestingly, these elements of the NSS fall under the broad essential task of "Igniting a new era of global economic growth through free markets and trade." The goals identified in the NEPDG report appear to be in line with the essential tasks of the NSS however the NEPDG report contains stronger and clearer language regarding reducing energy dependence. Further, the statements made by our presidents over the past 40 years very clearly state the requirement for energy independence yet this language is absent from the NSS. What is missing from the NSS is the identification of the specific "Ends" or the clear objective of achieving independence from foreign sources of oil. Once codified in the National Security Strategy, this strategic objective "end" could then be incorporated into the future National Energy Policy, the National Defense Strategy and the National Military Strategy, where the specific ways and means of achieving this objective will be presented.

The National Defense Strategy of June 2008 identifies five objectives that must be met in order to achieve the grand strategic objectives of the NSS. The NDS also identifies five methods that will be utilized to achieve the NDS objectives. The document addresses the requirement for the Defense Department to reduce our military's fuel demands in the context of securing strategic access and maintaining freedom of action.[31] This is identified as one of the five methods of achieving the NDS objectives. Previous versions of our NDS did not specifically recognize the linkages between the global economy, ready access to energy resources and our national security objectives. However, the current NDS does not go far enough in explaining how lowering the Department's demand for energy will assist as a means in achieving the objectives of the National Security Strategy. This can be explained partially due to

shortfalls in the NSS and the date, which it was published. The language used in the NDS is curious as well stating, “the Department is examining its own energy requirements” is a clear indication that at the time of its publication the DoD was not yet ready to present a strategy to reduce its energy usage.[32]

The National Military Strategy of the United States was last produced in 2004. This NMS identifies three Military objectives that are designed to support the NSS and NDS. These objectives are: protect the United States, prevent conflict and surprise attack, and prevail against adversaries. The NMS also describes three priorities: Win the War on Terrorism, Enhance our ability to fight as a joint force, and Transform the Armed Forces.[33] The 2004 NMS does not contain any reference to energy security or reducing the military’s dependence on fossil fuels. This is certainly understandable as the document was last produced in 2004 and was written to support older outdated national security documents. It is entirely appropriate to expect to see the Chairman’s vision of how the Joint Force is going to reduce its dependence on fossil fuels articulated in this document. The NMS should identify the specific military problem that needs to be fixed in order to achieve the objectives of the 2008 NDS. Specifically, the U. S. military’s dependence on fossil fuels limits our ability to secure strategic access, maintain global freedom of action and hinders our ability to fight and win the Long War.

The means to reduce our military’s dependence on fossil fuels should also fall under purview of this document and fit nicely under the banner of enhancing our ability to fight as a joint force and transforming the armed forces. This would be an appropriate document to state the four goals of the DoD’s strategy and identify them as a means of achieving our objective:

- Maintain or enhance operational effectiveness by reducing total force energy demands - Reduce Demand;
- Increase energy security through strategic resilience – Assure Supply;
- Enhance operational and business effectiveness by institutionalizing energy solutions in DoD planning and business processes; and
- Establish and monitor Department-wide energy metrics. [34]

Taking a Lead Role

Why should DoD take a lead role in the U.S. effort to achieve energy independence by reducing our dependence on fossil fuels? The simple answer is that our military is also heavily dependent on fossil fuels and this issue needs to be addressed in order to achieve our national security objectives. Specifically, our military's dependence on fossil fuels limits our ability to secure strategic access, maintain global freedom of action and hinders our ability to fight and win the Long War.

Examining DoD's fuel usage, operational costs, impacts on force protection and sustainment, and the benefits of dual use technology, will provide some of the rationale for a DoD fuel reduction initiative. The flow oil revenues to governments hostile to the U.S. and the negative impact of fossil fuels on global climate change and our environment add further weight to the argument.

The Department of Defense is the single largest user of energy in the United States. In FY06, the Department consumed 110 million barrels of oil at a cost of $13.6 billion.[35] The Defense Department's annual consumption accounts for 1.2% of our country's annual energy usage and 93% of the federal government's annual energy usage.[36] Historically transportation and mobility account for 78% of DoD's fuel usage,

that is fuel consumed by aircraft, ships and ground vehicles. When the United States Army takes to the field of battle, over 70% of the tonnage required to position the Army is fuel.[37] Aviation fuel is the largest consumption area accounting for 53% of DoD's fuel demand.[38]

Some would argue that reducing the 1.2% usage of the DoD would have only a small impact on reducing the nation's overall energy consumption. However, seemingly small reductions in energy consumption can represent large reductions in cost. In the same manner a relatively small increase in the price of oil or a disruption in supply can cause significant increases in DoD's fuel costs. In FY07, the DoD spent $13.5 billion on fuel and was forced to request an additional $5 billion in FY08 in order to ensure that the department could support the increased fuel costs. It is estimated that a $10 per barrel increase in oil prices increases DoD's costs by approximately $1.3B per year.[39] The Defense Science Board (DSB) of 2001 found that DoD's cost analysis of delivering fuel was based on a "standard cost of fuel" rather than the "true cost" of fuel. The task force determined that the actual cost of fuel should include the costs of delivering fuel to the warfighter. This concept has become know as the "Fully Burden Cost of Fuel" (FBCF).[40] Therefore, leaders were utilizing an artificially low cost of acquiring fuel when making decisions.[41] The DSB found that the actual costs of delivering fuel over-land in a combat zone to be $15 per gallon and the cost of delivering fuel via airborne tanker to be 26% per gallon.[42]

The day-to-day demand for fuel in Iraq and Afghanistan is greater than in any war in our nation's history. The U.S. military uses about 1.7 million gallons of fuel a day in Iraq and counts on an estimated 2,000 trucks to bring supplies into Iraq from

Kuwait.[43] According to Robert Bryce's 2005 article in Atlantic Monthly, "each of the 150,000 soldiers on the ground consumes roughly nine gallons of fuel a day."[44] To put this in historical perspective, General George Patton's Third Army had about 400,000 men and consumed about 400,000 gallons of gasoline per day.[45] The extent of the current fuel demands in Iraq and Afghanistan present a significant cost burden but also a significant force protection issue.

Figure 2. Logistics Convoys in Iraq.[46]

The large logistic trail that is required to support our forces fuel requirements in the field present a lucrative target for our enemies. In August 2006, Major General Richard C. Zilmer, Commanding General Multi-National Forces West, submitted an

urgent request to the Pentagon for a renewable energy source to replace diesel-powered generators at remote outposts.[47] His intent was to reduce the number of road bound convoys required to resupply the outposts with fuel, thereby reducing the number of Marines on the roads and increasing force protection.

Comparing the Defense Department's fuel consumption with that of the rest of the United States we will see that our petroleum usage directly resembles that of the American private sector. The vast majority of petroleum usage by both the military and civilian population occurs in the transportation sector. As stated above, the DoDs largest demand occurs in the Aviation sector and the private sectors fuel demand is overwhelmingly in the automobile sector. Efforts by DoD to take advantage of advanced technology can directly transfer to benefits in the civilian transportation sector. There are several historical examples where the development of military technology or dual use technologies has directly benefited the civilian sector. Advances in satellite technology, global positioning system, and internet development are just a few small examples.

It is time for somebody to get out front in and lead the way. Oil independence is such a volatile issue that few politicians will make the required hard choices. It appears that few members of the private sector, business and industry are willing to take the risks and make the investments that are required to change the nature of our energy demand. DoD energy initiatives are directive in nature and therefore can be resistant to market influences, while many civilian energy conservation initiatives have ridden the waves of fluctuations in the global oil demand cycle. Private sector efforts to reduce oil demand increase considerably during periods of rising prices and tend to reduce during

periods of stable or low oil pricing conditions. These conditions are illustrated early in this paper highlighted by the impact of oil price increases and associated energy crises.

Current DoD Efforts

The Department of Defense's current strategy is unpublished in an official manner; yet exists in the various documents produced by the DoD Energy Security Task Force. The Energy Security Task Force's stated objective is to "define an actionable investment roadmap for lowering the DoD's fossil fuel requirements and developing alternative fuels for use by the department."[48] DoD's recent accomplishments and security initiatives were presented in October 2008 in the form of the DoD report to congress on energy security issues. The goals of the DoD strategy are clearly outlined in this document:

- Reduce Demand.
- Assure Supply
- Improve Processes
- Establish Metrics.

Appendix A of the DoD report to congress contains a specific list of energy goals and the source that mandated the requirement. Interestingly, the energy goals identified have been established by eight different sources. The Department of Defense has received direction from Executive Orders, energy legislation in 2005 and 2007, Chairman of the Joint Chiefs Instructions and the National Defense Strategy of 2008. This illustrates the complexity of the problem and a lack of unity of effort. Despite direction form multiple sources and the lack of a complete strategy, in 2007, the Defense Department has achieved a 10% reduction in energy usage from a 2003

baseline.[49] The majority of these reductions in energy consumption have come from the infrastructure and installations.

The DoD has taken steps to include energy efficiency as a Key Performance Parameter (KPP) when analyzing and making acquisition decisions. The Under Secretary of State, for Acquisition, Technology and Logistics (USD)(AT&L) established a Department policy in 2007 mandating the use of "fully burdened cost of fuel" in making all acquisition trade analysis.[50]

There have been several studies either commissioned or conducted by the Department of Defense concerning energy and fuel consumption. The Defense Science Board Task Force, The DoD Energy Security Task Force, the Logistics Management Institute (LMI) study of Energy Strategy and the MITRE Corporation's JASON Report: Reducing DoD Fossil Fuel dependence. These studies provide valuable insight into DoD fuel usage and provide recommendations for energy strategies for reducing the Department's fuel usage. Many of the recommendations generated by these studies have been implemented, however, the majority have not yet been implemented or have yet to generate the intended results. The number one finding of the 2008 report of the Defense Science Board Task Force on DoD Energy Strategy stated that the recommendations from the 2001 DSB report had not yet been implemented.[51] The DoD has made some progress in reducing fuel demand but still has a long road ahead before significant progress can be made.

Conclusions

The United States and the Department of Defense's dependence of fossil fuels is a critical national security issue. The U.S. and the DoD need to decrease their

dependence on foreign oil in order to ensure that our national security objectives can be met. This effort will require determined and disciplined leadership as well as involving all elements of the national government. The key to eliminating dependence on foreign oil resides in the transportation sector. The U.S. Military and the private sector need to focus their efforts on reducing the oil demand of motor vehicles, aircraft and ships.

The U. S. needs to establish a national energy policy with an ultimate goal of achieving energy independence. The nature of the global oil markets largely negates any attempt to completely isolate the U.S. from rising oil prices and supply disruptions. However, the reality of the world oil market should not discourage the U.S. from it's objective of achieving energy independence as defined in this paper.

Our nation's energy security objectives have not been clearly articulated in our national security documents, including the National security Strategy, National Defense Strategy and the National Military Strategy. Our Nations military can and should play a lead role in achieving this critical goal, but first need a unifying strategy.

Recommendations

The United States needs to develop a comprehensive national energy security policy that charts the course that our nation is going to take in achieving energy Independence. The U. S. cannot achieve its objectives without continuity across all elements of the government and this will not happen without an energy policy. The ultimate goal of the national energy security policy should be to achieve energy independence by reducing our nation's dependence on fossil fuels.

The national government must also come to a common definition of national energy security and energy independence. In order to ensure proper alignment the

following definition of energy security should be utilized by all elements of the national government and the Department of Defense: National energy security is the ability of a nation to provide adequate amounts of affordable, safe, and environmentally sound energy to meet immediate demand, ensure economic growth and national defense, while protecting against catastrophic events and ensuring the integrity of the global energy delivery system.

The following definition of energy impendence is offered for consideration by inclusion in our national energy security document: Energy independence is the ability of a nation to achieve a balance between oil production and consumption, which places the government in a position where energy decisions are not subject to the control of other nations. As such, the nation can purchase the amount of oil of its choosing, from the source of its choosing regardless of pricing or catastrophic events.

The Department of Defense needs to continue the development of a strategy to reduce its dependence on fossil fuels that is aligned with our national efforts. This strategy must ensure unity of effort across the Joint Force. This can best be accomplished by first incorporating this national objective into our National Security Strategy. Then ensure that the NDS and NMS further define goals and identify the means for achieving this goal. The development of such a strategy will also assist in altering the culture of the military toward accepting the need to reduce energy consumption.

Our Military's leadership must support the fuel demand reduction imitative. Each Combatant Command and service headquarters should develop a separate energy security strategy or incorporate the elements of energy security in the command's

existing strategy. The creation of an Energy Security Task Force liaison element within each combatant command and service headquarters will ensure proper alignment between Combatant Commander and Service Chief's vision with that of the DoD strategy. These elements will assist in delivering the right systems to the warfighter at the proper time and provide feedback to the DoD Task Force.

Incorporate the following mission statement into the National Military Strategy: The Department of Defense will reduce its dependency on fossil fuels by: reducing demand, ensuring supply, improving internal processes and procedures, and establishing specific metrics, in order to create greater operational reach, sustainability, resilience, and persistence on the battlefield. Doing so will contribute significantly to achieving national objectives of assuring strategic access, maintaining global freedom of action and ensure victory in the Long War.

The United States and it's military can and will reduce its dependence on foreign sources of oil. Coordinating the effort across all elements of the United States Government will ensure success. The Department of Defense is poised to play a significant role in achieving this objective.

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